

**Statement By  
National Coalition for Food and  
Agricultural Research  
Before The  
House Agriculture Committee**

Subcommittee on Conservation, Credit, Rural Development and Research

Public Hearing  
1300 Longworth HOB

Review of agricultural research

Washington, DC  
Wed. June 27 - 10:00 a.m.

Thank you, Mr. Chairman for inviting the National Coalition for Food and Agricultural Research (National C-FAR) to testify. I am Terry Wolf, a grain producer from Illinois and President of the National C-FAR. Our Coalition looks forward to working with this Subcommittee as we seek to **double federal investments in food and agricultural research over the next 5 years.**

We want to thank the members of this subcommittee for your support of food and agricultural research and education programs that have helped propel the world-renowned success of the U.S. food and agricultural sector. We want to keep the U.S. food and agriculture sector at the forefront. We are here to explain the crucial role that food and agricultural research plays in meeting that important goal. In the immortal words of George Washington, "there is no more important service than to improve agriculture."

I will be hitting the main points but request that the complete statement be included as part of the official hearing record.

In our testimony, we offer our perspective on four important questions:

- 1) Why should the federal government invest in food and agricultural research, extension and education?

- 2) What have been the measurable benefits of federal investments for American farmers and consumers?
- 3) Why should we double federal investments in food and agricultural research over the next 5 years?
- 4) How should the doubled funds be invested?

The member organizations of our coalition are mindful of the pressing challenges facing U.S. food and agriculture. Several of our members have testified to in recent weeks relative to the farm bill and related issues. However, members of National C-FAR believe it is important to address the promising opportunities ahead and the federal policies and programs needed to promote the long-term health and vitality of food and agriculture for the benefit of producers and consumers. We believe increased federal support for food and agricultural research and education should be a key component of this Committee's goal to develop sound food and agricultural policy.

#### **National C-FAR**

National C-FAR is a newly organized broad-based stakeholder coalition of some 90 food, agriculture, nutrition, conservation and natural resource organizations. (Membership list is attached.) We are a nonprofit, nonpartisan, stakeholder-driven, and consensus-based coalition focused on federal food and agricultural research funding. We are dedicated to fostering public confidence in food, agricultural, nutritional and natural resource research through public participation in planning and evaluating the process and impact of research activities. Our membership is open to those who support the objectives of (1) enhancing federal investments in U.S. food and agricultural research and extension and (2) expanding stakeholder participation in identifying funding needs and opportunities.

National C-FAR's goal is to **double federal funding of food, nutrition, agriculture, natural resource, and fiber research, extension and education programs during the next five years.** This is to be net additional funding on a continuing basis that complements, not competes with or displaces the existing portfolio of federal programs of research and education.

#### **1) Why Should The Federal Government Invest In Food And Agricultural Research, Extension And Education?**

##### **Food and Agriculture are of Fundamental Importance**

The food and agriculture sector is a major contributor to society. Food is a fundamental need of every person. Food not only maintains life, but it sustains life and provides the basic requirements for a healthy, productive, creative society.

Agriculture creates jobs and income. The food and agriculture sector and their related industries provide over 20 million jobs, about 17 percent of U.S. jobs, and account for nearly \$1 trillion or 13 percent of GDP.

Agriculture reduces the trade deficit. Agricultural exports average more than \$50 billion annually compared to \$38 billion of imports, contributing some \$12 billion to reducing the \$350 billion trade deficit in the nonagricultural sector.

Agriculture contributes to the quality of life. Farmers provide many valuable and taken-for-granted aesthetic and environmental amenities to the public. The proximity to open space enhances the value of nearby residential property. Farmland is a natural wastewater treatment system. Unpaved land allows the recharge of the ground water that urban residents need. Farms are stopovers for migratory birds. Farmers are stewards for 65 percent of non-federal lands and provide habitat for 75 percent of wildlife.

Food and agriculture are strategic resources. When food is scarce, peace and democracy are threatened. We have fed our allies during the great wars; we have aided the starving during famines, floods and strife; and we have provided assurances of food that have nurtured the rise of freedom following the collapse of communism.

Our abundant food supply bolsters our national security and eases world tension and turmoil. Science-based improvements in agriculture, which has drawn upon U.S. food and agricultural research, have saved over a billion people from starvation and countless millions more from the ravages of disease and malnutrition.

### **Federal Funding Needed Where Private Sector Lacks Incentive**

Private firms undertake research if they expect that the funds invested will yield a positive net return to them. Private firms have an incentive to invest in research and development where the expected outcome can 1) be embodied in a product or service that has a market, 2) be protected by intellectual property rights and 3) generate a payback in the near term. In areas where these conditions are met, private research funding is

likely to be adequate.

Public financed research should complement private research by focusing in areas where the private sector does not have an incentive to invest. Information, one of the main drivers of our economy today, indeed the term used to name our present age, shares many characteristics with research which often necessitate some public support.

state are likely to "spill-over" and aid livestock producers in neighboring states or the entire nation.

The benefits of extension and education, in terms of Chart 1, can be visualized as accelerating or quickening the benefit stream. Extension education serves to speed adoption and use of research results and hence increases its payoff to society. Extension does more than accelerate adoption and use; it also helps identify the problem in the first place and provides timely feedback during the development and adoption phases.

## **2) What Have Been The Measurable Benefits Of Federal Investments For American Farmers And Consumers?**

### **Agricultural Research and Education Have Benefited U.S. and World**

High Return on Investment: Many factors have contributed to the unparalleled success of American agriculture -- the favorable soils and climate, hard work and dedication of farm families, democratic system, free enterprise, transportation, communication, diet and nutrition and government policy, but one factor of undeniable importance was the expansion of food production enabled in large part by science-based advances in food and agriculture. Hence, agricultural research and education have played a major role in making the U.S. food and agriculture sector the envy of the world and are essential to keeping it thus.

The contribution of publicly supported agricultural research to advances in food production and productivity and the resulting public benefits are well documented. A recent analysis by the International Food Policy Research Institute of 292 studies of the impacts of agricultural research and extension published since 1953 is summarized in Chart 2. In these nearly 300 studies, spanning a half century, and involving 1,852 separate estimates, the median annual rate of return on public investments in food and agricultural research and extension was a whopping 44% -- an extremely high rate of return by any benchmark. Clearly, hard and compelling facts prove beyond any doubt that investments in food and agricultural research have returned enormous benefits to the American people.

While of great importance to the farmer, improvements in agricultural productivity generated by food and agricultural

research and education are broadly shared with society. Half or more of the benefits are redound to consumers in terms of an efficient production system competitive in the global environment; a safe and secure food and fiber system; a healthy; well-nourished population; greater harmony between agriculture and the environment; and a growing economy and improving quality of life. This tremendous pay-off of public investments in agricultural research and education over the past 50 years amount to \$3,400 of annual savings on the food bill of the average American family. And, since lower income families spend a higher proportion of their income on food, the benefits of improvements in advances in agricultural productivity are proportionally greater for low income families.

Productivity growth, measured as output per unit of inputs, has grown very rapidly in agriculture at an annual pace of 1.9% -- nearly double the pace of 1.1% in the non-farm business sector. In fact, as Chart 3 shows, over the past 50 years, agriculture production has more than doubled, while the aggregate of all tangible inputs has actually declined by about 10%. In other words, all the increase in U.S. agriculture production for the past 50 years has been due to increased productivity, not due to more inputs. Research and education, both public and private, have been the prime driver of this phenomenal productivity growth.

Saving Land and the Environment: Advances in agricultural productivity have contributed to enhancing the environment and the quality of life. In his speech to the National C-FAR Inaugural meeting on January 30, 2001, Dr. Norman Borlaug, the Nobel Peace Prize recipient and one of the most distinguished agricultural scientists in the world, stated:

"American farmers and ranchers not only have been able to increase agricultural production many-fold through the application of science and technology, I contend that they have also been able to achieve these production feats in ways that have helped conserve the environment, not destroy it. For example, had the U.S. agricultural technology of 1940 ...still persisted today we would have needed an additional 575 million acres of agricultural lands--of the same quality--to equal the 1996-97 of 700 million tons for the 17 main food and fiber crops produced in the United States [Chart 4].

"Put another way, thanks to the agricultural productivity increases made possible through research and new technology

development, an area slightly greater than all the land in 25 states east of the Mississippi River has been spared for other uses. Imagine the environmental disaster that would have occurred if hundreds of millions of environmentally fragile lands, not suited to farming, had been ploughed up and brought into production. Think of the soil erosion, loss of forests and grasslands, and biodiversity, and extinction of wildlife species that would have ensued!"

In addition to this benefit of added agricultural productivity, research focused directly on soil conservation and land preservation such as reducing soil erosion through conservation tillage, buffer strips, and cover crops and the development of "smart growth" policies have also made major contributions.

#### Minimizing Healthcare Costs through Disease Prevention:

Nutrition and diet-related research discoveries benefit everyone. New technologies are needed to reduce the likelihood of pathogen transmission by food, to improve the quality of processed foods, and to deliver greater nutritional value in foods. Additionally, the healthcare costs reduced by advances in nutrition research have saved the American taxpayer untold millions. As health costs continue to rise, it is imperative that our medical practices take a preventive approach. This requires a thorough understanding of the role of nutrients in foods in preventing chronic illnesses such as heart disease, cancer and diabetes.

Research in food safety and human nutrition has paid-off with considerable benefits to society. It complements the funding of disease-related research by focusing on prevention through diet and nutrition. An important new area of nutrition research is to discover how foods and food components (not typically thought to be traditional nutrients) can prevent various diseases throughout the lifecycle. Research on the content, availability, and safety of the food supply is extremely useful to the consumer by achieving optimal health in using agricultural commodities as part of our diets. This investment in nutrition research increases knowledge that prevents diseases and ensures a healthy and productive society.

### **3) Why Should We Double Food And Agricultural Research?**

We should double food and agricultural research in the next five years for three basic reasons: First, despite past progress and contributions, many challenges remain. Second, federal funding

of food and agricultural research has been essentially flat for two decades, the scientific base upon which food and agriculture advances have been built is at risk. Third, there will be the opportunities lost or innovations that will not occur unless there is increased support. Research helps justify or minimize the risk of investment which produces the next generation of solutions.

### **Solve Pressing Problems**

World food demand is escalating. World population and income growth are expanding the demand for food and improved diets. World food demand is projected to double in 25 years. Most of this growth will occur in the developing nations where yields are low, land is scarce, and diets are inadequate. Without a vigorous response the demand will only be met at a great global ecological cost.

Food-linked health costs are high. Some \$100 billion of annual U.S. health costs are linked to poor diets and food borne pathogens.

Farm income is low. U.S. farmers are suffering from some of the lowest prices in over two decades. Emergency federal farm assistance programs are spending record sums to avert a catastrophic farm situation. Longer term approaches to the assist farmers add and retain value of their commodities. Indeed, there was much discussion during the 1996 farm bill that expanded food and agricultural research could enhance competitiveness and value-added opportunities and be an engine for growth. But the major commitment to expanded research has not yet materialized.

Food safety concerns and expectations are rising. Some of the new food products based upon genetically modified organisms are raising increased public awareness and concern about the safety of our food supply.

We can reduce the threats to our environment and improve sustainability by gaining a better understanding of the ecosystem and the development of more environmentally friendly practices.

Energy costs are escalating, our dependence on petroleum imports is growing and our concerns about greenhouse gases are rising. Agriculture provides the potential for renewable sources of



energy and cleaner burning fuels that will reduce our dependence upon rising petroleum prices and imports.

We need improved bio-security and protection. The need for bio-security and bio-safety tools and policies to protect against bio-terrorism and dreaded problems such as foot-and-mouth and "mad cow" diseases and other exotic plant and animal pests, protection of range lands from invasive species, new ways of sustaining agricultural productivity and production growth, and solutions to the environmental issues related to global warming, limited water resources, competing demands for land and other agricultural resources, are major challenges for the research and education agenda.

### **Avert Risk of Losing Competitive Advantage**

Federal funding of food and agricultural research has been flat for over 20 years. It has declined relative to all federal research and relative to agricultural research in the rest of the world.

Federal funding of food and agricultural research in the USDA, measured in real (inflation-adjusted) dollars is less than it was in 1978 (Chart 5). In 1978, in constant dollars, USDA food and agricultural research and education funding was \$1.64 billion, in 2000 the funding was \$1.6 billion.

Federal funding of food and agricultural research has not kept pace with funding of all federal research. According to The National Science Foundation, total federal research funding during 1982 to 1998 increased in constant dollars, but funding of food and agricultural research decreased. The food and agriculture research share of the federal total has fallen from 4.2% to 2.5% (Chart 6).

We may be in danger of falling behind the national support of research in other countries. Public funding of agricultural research in the rest of the world outside the U.S. during 1971-1993 increased nearly 30% faster pace than in the U.S. (Chart 7). While we still have the leading public supported food and agricultural research and education program in the world, our edge is shrinking. In this Internet Age of global agriculture, the international transfer of technology across borders is accelerating, making it much more difficult to sustain our lead unless we increase our federal support. Currently, we only invest about \$1 of federal funds of agricultural research per

every \$500 of consumer expenditures of food and fiber - a very low rate indeed (Chart 8)!

### **Capitalize Upon Expanding Opportunities**

The third reason, but perhaps most important one, for doubling food and agricultural research is to capitalize upon the promising opportunities that advances in science and technology make possible. Advances in science and technology are opening the way to tremendous opportunities such as the sequencing of the human, plant, and animal genomes. Taking advantage of these unprecedented biotechnological advances will require significant increases in research funding. If we do not, the technological advantage the U.S. now enjoys in these areas will be lost. This loss of our scientific leadership will have a very adverse impact on our use of new technologies that will fuel our economy over the next decades.

## **4) How Should the Doubled Funds Be Spent?**

### **Goals**

We believe increased funding of food and agricultural research will result in:

- Safer, more nutritious, higher quality, more convenient and affordable foods
- More efficient and environmentally friendly food, fiber and forest production
- Improved water quality, resource conservation and environment
- Less dependence on non-renewable sources of energy
- New and improved products, expanded global competitiveness and improved balance of trade
- More jobs and sustainable rural economic development
- Better protection for our agricultural and natural resources from new, emerging, and imported plant pests and animal diseases

National C-FAR does not have a list of specific research recommendations. However, our members and their association with other related coalitions, we are well aware of urgent research needs to address and opportunities to explore.

## **Authorization & Leveraging**

Legislative authorization of food and agricultural research and education is in several major pieces of legislation including the Hatch Act of 1887, The Smith-Lever Act of 1914 and most recently the Agricultural Research, Extension, and Education Reform Act of 1998. Several key provisions of the 1998 Act expire in 2002. National C-FAR recommends that:

- 1) The basic authorizations and provisions of the 1998 Act be extended and incorporated in the new farm bill
- 2) An additional provision be included that it is the sense of Congress that federal funding of research, extension, and education be doubled over the next five years
- 3) Provisions be strengthened to expand stakeholder participation in identifying research and education funding needs and opportunities

The current definition of "food and agricultural sciences" in Chapter 64- Agricultural Research, Extension and Teaching, Section 7, Paragraph 3103 (8) is "basic, applied and developmental research, extension, and teaching activities in the food, agricultural, renewable natural resources, forestry, and physical and social sciences in the broadest sense of these terms." We support a broadening of this definition to include expanded international market opportunities, protection from plant and animal diseases and pests, and human nutrition and health. We also support a better identification of the various food and agricultural research programs throughout the federal government and improved the coordination of these programs. The challenges and opportunities of the food and agricultural sector require the interest, support, and participation of all federal agencies.

## **Building Capacity and a Balanced Portfolio**

National C-FAR and its member organizations have identified several emerging needs and opportunities which we soon will explain, but we first want to emphasize the continuing need to build the capacity to do quality research and education, including human resources, competitive grants, infrastructure support, formula funds, and core programs. Research and education is the foundation of knowledge upon which the food and agricultural sector depends. This foundation must be kept strong, lest it crumble and curtail the strength and expansion of this trillion dollar sector. Even to maintain existing productivity, substantial maintenance research is necessary.

Discovery is a continuous process that must be ongoing, not a one-time eureka moment.

It is important to maintain a balanced portfolio of federal research and education programs, including competitive grants, formula funds and intramural programs. Agriculture is a biologically based industry. Many of the problems and opportunities are site specific. Results must be adapted to fit local conditions. Hence, we need to maintain a diversified and decentralized research and education system.

### **Areas of Opportunity**

Several coalitions, committees and scientific societies, including those listed below, have identified these needs and opportunities:

- Coalition for Research on Plant Systems - CROPS '99
- Food Animal Integrated Research for 2002 --FAIR 2002
- Institute of Food Technologists -Food for Health Research Needs
- Council on Food, Agricultural, and Resource Economics -- Economics and Research Priorities for an Efficient and Sustainable Food System
- American Society for Nutritional Sciences
- National Agricultural Research, Extension, Education, and Economics Advisory Board
- American Dietetic Association
- National Association of University Fisheries and Wildlife Programs (NAUFWP)

Members of our Research Committee have presented to our Board a compilation of these studies.

Major areas of research that have been commonly identified by most, if not all, of the related coalitions that are in need of additional funding include:

- Food security, safety, fortification, enrichment and allergens
- Nutrition and public health
- Production quantity and quality; nutrient adequacy; global competitiveness; and new market opportunities
- Environmental stewardship and resource conservation and the scientific basis for public policies relating to the environment, plants and animals

- Increasing knowledge, skills, and expertise
- Emergency preparedness for emerging plant and animal diseases and bio-terrorism
- Product pioneering for food, nutrition, biobased materials and biofuels
- Genetic resources, genetic knowledge, and biotechnology
- Jobs and rural community economic vitality
- Education and outreach to producers, processors and consumers including food safety, sound nutrition, conservation, management, and new technology

Our coalition arose from a shared concern about the capacity of our agricultural research system as a whole to meet the future demands and capitalize on emerging opportunities. We will need a research system that simultaneously satisfies needs for food quality and quantity, resource preservation, producer profitability and social acceptability. This coalition will be working on ways to help assure that these needs are met.

## **Conclusion**

In conclusion, we hope we have convinced you that:

- 1) Food and agriculture is an important sector that merits federal attention and support.
- 2) Food and agricultural research and education have paid huge dividends in the past, not just to farmers, but to the entire nation and the world.
- 3) There is an appropriate and recognized definable role for federal support of research and education.
- 4) Federal investments in food and agricultural research should be doubled over the next 5 years.

We believe doubling of federal food and agricultural funding is a strategic and sound investment that would: 1) benefit producers and consumers of all commodities and all states; 2) improve income opportunities for farmers; 3) contribute to the United States remaining the best fed country with the lowest share of income spent on food; 4) strengthen our competitiveness in the global marketplace, while achieving the proper balance with human and environmental needs; 5) enable producers to produce safer, healthier foods; 6) find new uses for

agricultural products; and 7) enhance the protection of our renewable natural resources.

Again, we appreciate the opportunity to share our views. We look forward to working with you and the members of this Subcommittee in support of these important long-term objectives.

# National C-FAR

## Membership List

June 20, 2001

### National Members

American Crop Protection Association  
American Dietetic Association  
American Farm Bureau Federation  
American Feed Industry Association  
American Meat Institute Foundation  
American Seed Trade Association  
American Society for Nutritional Sciences  
American Soybean Association  
American Veterinary Medical Association  
American Vintners Association  
Association of American Veterinary Medical Colleges  
Biotechnology Industry Organization  
CARET  
CoFARM  
Consortium for Sustainable Agriculture  
Research and Education (CSARE)  
Ducks Unlimited, Inc.  
Forest Landowners Association  
Institute of Food Technologists  
National Chicken Council  
National Corn Growers Association  
National Cotton Council  
National Council of Farmer Cooperatives  
National Grain & Feed Association  
National Pork Producers Council  
Sustainable Agriculture Coalition  
U.S. Rice Producers Association  
Wildlife Management Institute

### University Members

Association of 1890 Research Directors  
Auburn University  
Clemson University  
Cornell University  
Iowa State University  
Kansas State University  
Mississippi State University  
North Carolina State University  
North Central Regional Association of Agricultural Experiment  
Station Directors  
North Dakota State University  
Ohio State University  
Pennsylvania State University  
Purdue University  
South Dakota State University  
Southern Association of Agricultural Experiment  
Station Directors (SAAESD)  
Southern Illinois University  
Texas A & M University System  
University of Arizona  
University of Arkansas  
University of California, DANR  
University of Connecticut  
University of Florida  
University of Georgia  
University of Illinois, College of ACES  
University of Illinois Extension & Outreach

University of Kentucky  
University of Maryland, College Park  
University of Minnesota  
University of Missouri – Columbia  
University of Tennessee  
University of Wisconsin - Madison  
Virginia Tech  
Washington State University  
Washington University in St. Louis

### Corporate Members

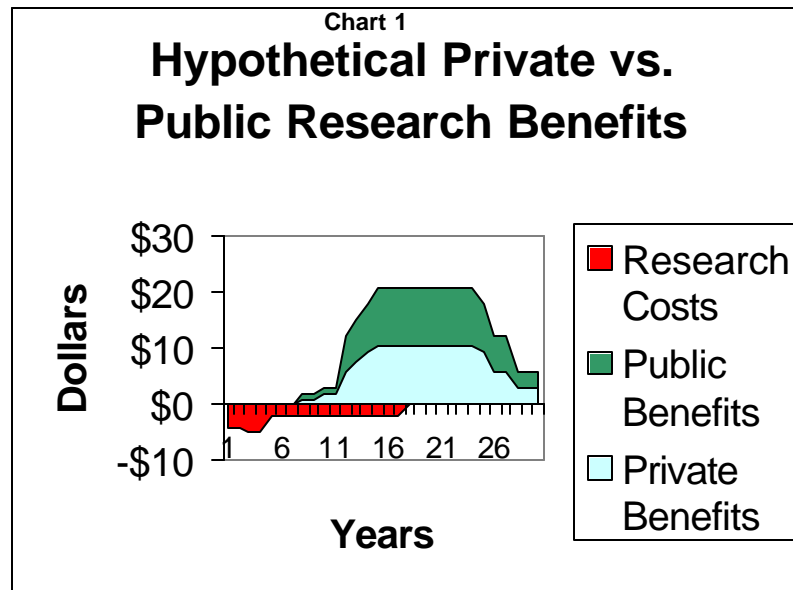
Gold Kist, Inc.  
Monsanto  
Ralston Purina Company

### Affiliate Members

Barry Sackin (American School Food Service Association)  
Becky Doyle (Andrews, Doyle & Associates)  
Brian M. Hyps (American Society of Plant Physiologists)  
Deborah T. Hanfman (USDA)  
Delmar K. Banner (Lietz, Banner & Ford)  
Donald Danforth Plant Science Center  
Dr. Bernadette Dunham (American Vet. Medical Assoc.)  
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Dr. Martin A. Massengale (University of Nebraska)  
Dr. Stephanie Smith (Institute of Food Technologists)  
Dr. Terry Nipp (AESOP Enterprises, Ltd.)  
Dr. W. David Shoup (Southern Illinois University)  
Farm Foundation  
Illinois Corn Marketing Board  
Illinois Farm Bureau  
Illinois Soybean Program Operating Board  
Jack Cooper (Food Industry Environmental Network)  
John L. Huston  
Kellye Eversole (Eversole Associates)  
Larry L. Groce (Producers Alliance, Inc.)  
North American Millers' Association  
Robert Mustell (RAM Associates)  
Rod Nilsestuen (Wisconsin Federation of Cooperatives)  
Seeley G. Lodwick (Green Bay Farms)  
Tamara Wagester (C-FARE)  
William Danforth (Washington University West Campus)

### Honorary Member

Dr. Norman Borlaug



**Chart 2**  
**44% Median Annual Return on Food and Ag Research From 100s of Studies**

	No. Observations	Median
Research	1,144	48%
Extension	80	63%
Research & Extension	628	37%
All Observations	1,852	44%

Source: Alston, et al, *A Meta Analysis of Rates of Return to Agricultural R&D*, International Food Policy Research Institute, Washington, DC, 2000, page 55



Chart 3

# All Increased Ag Production Due to Productivity

(Doubling of output with decrease in inputs)

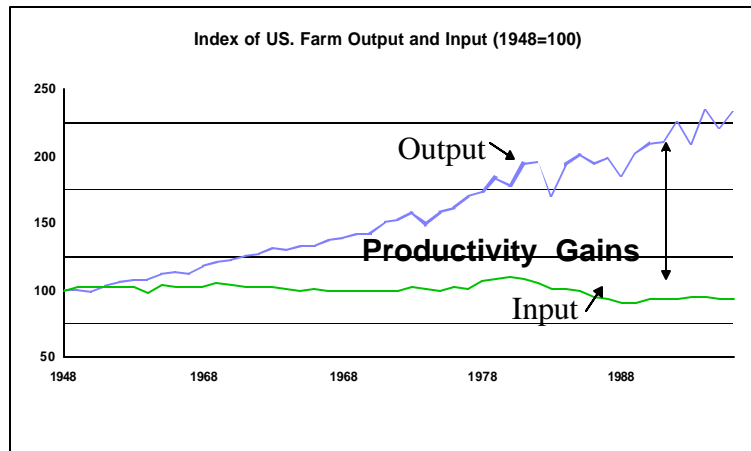
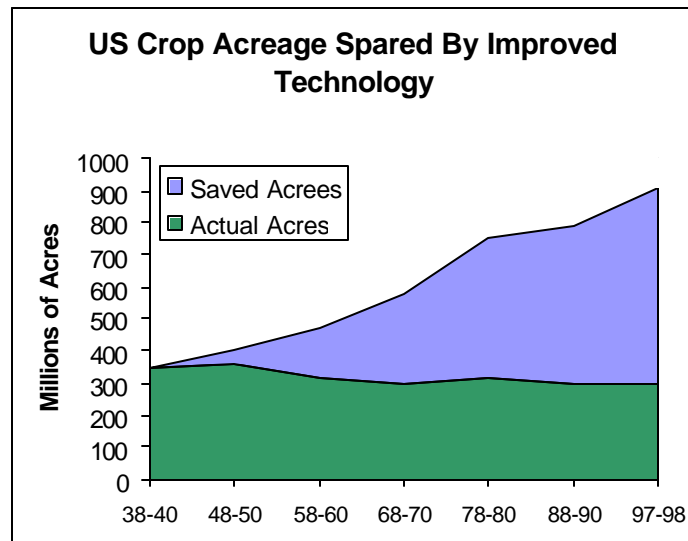


Chart 4



Adapted from Speech by Norman Borlaug, Jan 30, 2001. Acreage saved of 17 major food, feed and fiber crops assuming yield remained at 1938-40 average.

Chart 5

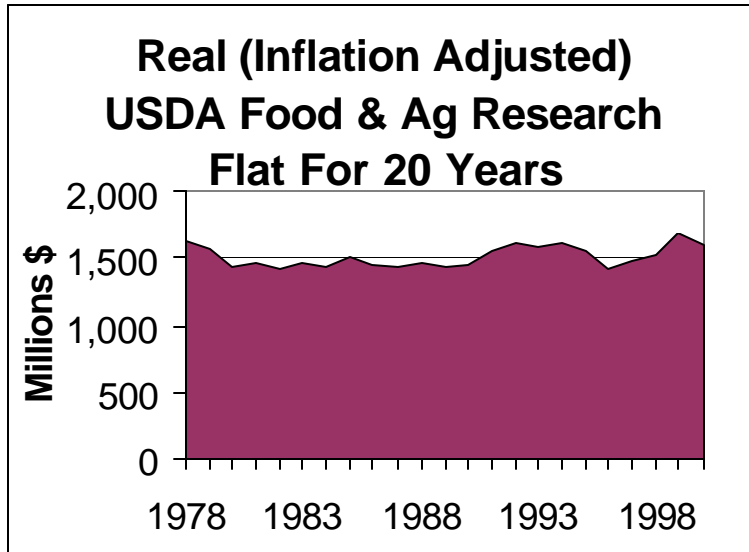
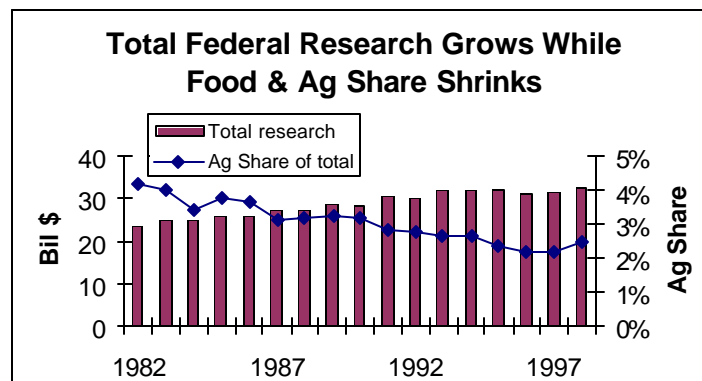


Chart 6



SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Federal Funds for Research and Development: Fiscal Years 1998, 1999, and 2000 . In constant Dollars.

Chart 7

## Will We Lose Our Edge?

### Rest of World Is Expanding Investments In Food & Agricultural Research Much Faster Than U.S.

Millions of 1985 constant international dollars

	1971	1993	% Increase
U.S.	1,230	2,074	41%
Rest of World	6,075	12,892	53%

Source: Julian Alston, *et al* "Paying for Agricultural Productivity,"  
Johns Hopkins University Press, Baltimore, 1999, pages 56, 61-63.  
Note, these data include both state and federal research.

Chart 8

## Only **\$1** Federal Food & Ag Research Funds per **\$500** Consumer Expenditures

- 2001 Farm Cash Receipts from Marketing = \$200 bil
- Farm share food dollar = 20%
- Retail value farm production  
=  $\$200 / 20\% = \$1,000 \text{ bil}$
- USDA food & ag research funds = \$2 Bil
- $\$2 \text{ bil} / \$1,000 \text{ bil} = \$1 \text{ Food \& Ag Research per } \$500 \text{ consumer food \& fiber purchases}$

